The effect of Banking Supervision on Central Bank Preferences: Evidence from Panel Data

Georgios Chortareas[a,b], Vassileios Logothetis[b], Georgios Magkonis[c,*], Kalliopi-Maria Zekente[b]

[a] Department of Management, King's College London, UK

[b] Department of Economics, University of Athens, Greece

[c] School of Management, University of Bradford, UK

Abstract

We examine the effects of banking supervisory architecture on central bank preferences, quantified through a recently proposed measure of central bank conservatism. Using a dynamic panel data specification we document that central banks serving both monetary policy and banking supervision functions are less inflation conservative than those with only a price stability mandate.

Keywords: Monetary Policy, Banking Supervision, Inflation Conservatism, Panel-data

JEL Codes: E58

* *Corresponding author:* Georgios Magkonis, School of Management, Emm Lane, BD9 4JL, Bradford, UK, tel: +44(0)1274236801, email: g.magkonis@bradford.ac.uk

1. Motivation and Hypothesis

The recently expanding mandate of central banks has generated concerns as to how financial stability considerations should interact with the price stability objective (especially in periods of crises). Such concerns emerge as topical against the background of the newly attributed banking supervisory function to the European Central Bank, while Blanchard (2015) suggests that the additional responsibilities of central banks have much more salient implications in the case of regulation and use of macroprudential tools.

A theoretical argument exists for separating monetary policy and banking supervision, highlighting the potential conflict of interest that may arise in attaining both objectives with one policy instrument (Goodhart and Schoenmaker, 1995). More recently, Ueda and Valencia (2014) show how an expanded mandate intensifies time-inconsistency problems. Another line of reasoning suggests that combining both functions allows for a more efficient conduct of monetary policy, especially during economic crises, because of central bank's direct access to supervisory information (Peek *et al*. 1999). Suggestions also exist for incorporating more explicitly financial stability concerns in monetary frameworks, e.g., by extending monetary policy's horizon to accommodate the financial cycle (Borio, 2014).

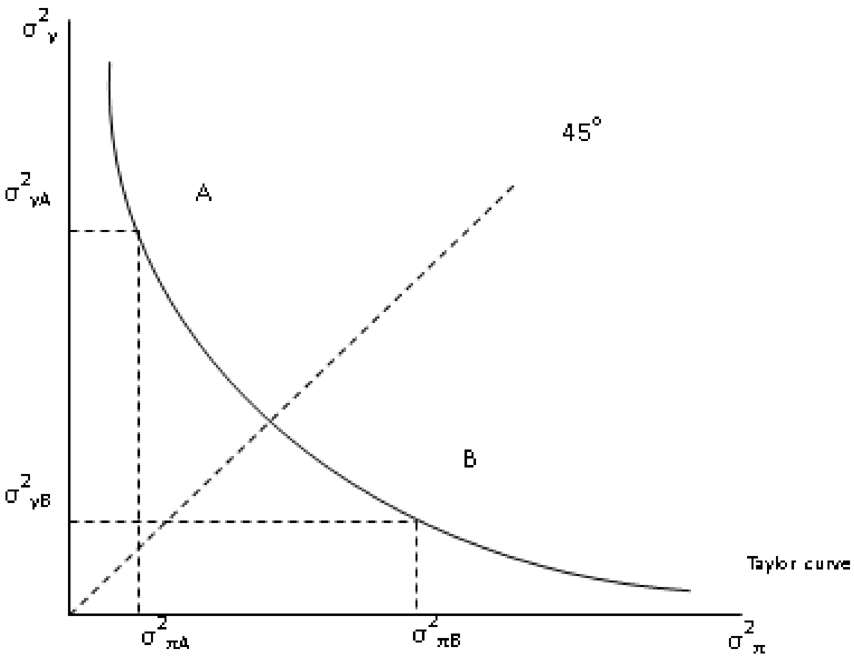
The empirical evidence on the effects of banking supervision on monetary policy effectiveness is scant and focuses on policy outcomes, indicating that inflation tends to be higher in countries where both functions are assigned to the central bank (Di Giorgio and Di Noia, 1999; Copelovitch and Singer, 2008). Policy outcomes, however, reflect both preferences and constraints (e.g., the structure of the economy). Thus, evaluating alternative institutional arrangements by focusing on policy outcomes (inflation, in our case) can be an imperfect way of assessing how institutions shape incentives and preferences, because often policy outcomes are not under the complete control of the policymakers (Krause and Méndez, 2008). In this paper we explicitly consider the direct effect of separating the functions of banking supervision and monetary policy on central banks' preferences.

To proxy policy preferences we use a measure of conservatism proposed by Levieuge and Lucotte (2014), which relies on the inflation-output gap variability trade-off, as captured by a 'Taylor curve' and is illustrated in Figure 1. Each point on the curve represents central bank's preferences with respect to the weight they place on inflation variability (σ_π^2) over output gap variability (σ_y^2). Thus, point A on the Taylor curve corresponds to a more conservative central bank as compared to point B. To obtain an empirical measure of central bank preferences Levieuge and Lucotte (2014) compute the conservatism as the angle value of each point of the Taylor curve, which is trigonometrically expressed as:

$$cons = \frac{1}{90}\left[\left(atan\frac{\sigma_y^2}{\sigma_\pi^2}\right)\left(\frac{180}{pi}\right)\right] \qquad (1)$$

where σ_y^2 and σ_π^2 are the variances of output gap and inflation, respectively. Using (1) and calculating inflation and output gap volatilities by estimating a GARCH(1,1) model for each country in our dataset we obtain a rescaled measure of conservatism on the [0,1] range, with the values close to 1 indicating a more inflation conservative central bank.[1]

[1] Detailed calculations are available upon request.



Source: Levieuge and Lucotte (2014, p.413)

2. Model and Estimation Strategy

We use a typical dynamic panel data model specified as:

$$cons_{i,t} = a + \beta cons_{i,t-1} + \gamma S + \delta X_{i,k,t} + \eta_i + \varepsilon_t + u_{i,j,t} \tag{2}$$

where *cons* is our the measure of conservatism, *S* denotes *Separation* as defined above, *X* is a vector of k control variables, η_i are unobserved country-specific effects, ε_t are time-specific effects and u_{ijt} is the error term. Our main explanatory dummy variable, *Separation,* takes the value of 0 if the central bank is in charge or involved in banking supervision and 1 when this function is delegated to a separate institution. We construct *Separation* using data from the *Bank Regulation and Supervision Surveys* (2001, 2003, 2007, 2012) carried out by the World Bank and national monetary or banking supervisory authorities. To capture the persistence of central banks preferences we use a dynamic specification with one lag. Our dataset, which is determined by data availability and consistency for all the series used, covers 35 economies[2] from 1999 to 2010. The vector of control variables captures several aspects of the macroeconomic conditions, monetary policy institutional design, as well as, external constraints and exogenous factors. Specifically, macroeconomic variables include the GDP growth rate and government spending as percentage of GDP. The monetary institutional variables include an index of central bank independence (CBI) developed by Dincer and Eichengreen (2014) and a dummy that captures the adoption of inflation targeting (IT). The IT dummy takes the value of 1 if the country is an inflation targeter and 0 otherwise, based on the classification of Roger (2010). External constraints are captured by trade openness as percentage of GDP and capital account openness, as measured by the Chinn-Ito (2008) KAOPEN index. Also, to address the level of economic development we use a dummy (DEV) that takes the value of 1(0) when the economy is developed (developing) based on World Bank's classification. Finally, to further test the robustness of our findings, we distinguish between floating and fixed exchange rate regimes based on IMF's classification. We estimate equation (2) for the whole sample of 35 countries and, then, we re-estimate for the subset of countries that have floating exchange rates.

[2] Albania, Argentina, Australia, Botswana, Canada, Chile, Colombia, Croatia, Czech Republic, Hungary, Iceland, India, Indonesia, Israel, Japan, Jordan, Korea, Malaysia, Mauritius, Mexico, New Zealand, Nigeria, Norway, Peru, Philippines, Poland, Romania, Singapore, South Africa, Sweden, Thailand, Tunisia, Turkey, UK, US.

The presence of the lagged dependent variable and country specific effects renders the OLS estimator biased and inconsistent for Equation (2). To address this, we use the two-step System GMM estimator for dynamic panel data (Blundell and Bond, 1998). For robustness purposes, we also report the fixed-effects estimator.

3. Results

Table 1 presents the results from estimating different versions of Equation (2). For the majority of estimations, *Separation* emerges as positive and statistically significant, suggesting that central banks with a remit that focuses only on monetary policy tend to be more inflation averse than those which are also assigned to banking supervision. These results remain quite robust when we consider different specifications that focus on different control variables. Additionally, our results show that inflation targeters tend to have a stronger preference for inflation stability. This suggests that monetary policy frameworks may be endogenous to preferences.

To further test the robustness of our results we consider a number of additional controls. Following Copelovich and Singer (2008) we add the size of the banking sector (domestic credit as percentage of GDP), and its interaction with *Separation.* We also consider the interaction of *Separation* with its interaction with IT. Even thought the GMM results should be cautiously read as they do not satisfy all the necessary properties, the evidence still shows that separating monetary policy and bank supervision is positively associated with central bank's conservatism.

Finally, we replace conservatism (preferences) variable with simpler measures of central bank performance, such as inflation volatility[3]. If our hypothesis is valid, we would expect a negative relationship between separation and inflation volatility; a central bank that focuses only on price stability and not on supervision should display a better performance in combating inflation. The findings corroborate those of the basic model specification since the inflation variability coefficient is always negative and statistically significant (columns 8-12). Interestingly, for most of the cases, the interaction term of separation and IT is statistically significant. This indicates that the effect of separation in shaping more inflation-averse policies tends to be smaller within an inflation-targeting regime.

<Table 1 here>

4. Conclusions

A debate exists on whether financial stability concerns in general and banking supervision in particular should be incorporated into monetary policy frameworks. In this note we consider how separating monetary policy and banking supervisory functions affects central banks' preferences. Our evidence suggests that separating the supervisory function is an important determinant in framing more inflation-averse policies. Additionally, among various features of central bank institutional design, IT emerges as the one which is decisively associated with strong preference for price stability. Clearly, the nature and

[3] We thank an anonymous referee for stressing this point.

availability of institutional data to address such issues pose a challenge. A future research step is to develop and analyze more detailed indices on the areas of central banks' focus, and therefore more variation in the data.

References

Blanchard, O., 2015. Ten Takeaways from the 'Rethinking Macro Policy. Progress or Confusion?'. http://www.voxeu.org/article/rethinking-macro-policy-ten-takeaways

Blundell, R., Bond, S., 1998. Initial Conditions and Moment Restrictions in Dynamic Panel Data Models. Journal of Econometrics 87, 115–143.

Borio, C., 2014. Monetary policy and Financial stability: What Role in revention and Recovery? Bank of International Settelements, Working Paper, No 440.

Chinn, M. and Ito, H. 2008. A New Measure of Financial Openness. Journal of Comparative Policy Analysis, 10, 309 – 322.

Copelovitch, M. S., and D.A. Singer., 2008. Financial Regulation, Monetary Policy, and Inflation in the Industrialized World. The Journal of Politics. 70, 663-680.

Dincer, N.N. and B. Eichengreen, 2014. Central Bank Transparency and Independence: Updates and New Measures. International Journal of Central Banking 10, 189-250.

Di Giorgio, G. and C. Di Noia, 1999. Should Banking Supervision and Monetary Policy Tasks be Given to Different Agencies? International Finance 2, 361–78.

Goodhart, C. and D. Schoenmaker, 1995. Should the Functions of Monetary Policy and Banking Supervision be Separated? Oxford Economic Papers, New Series, 47, 539-560.

Krause, S. and F. Méndez, 2008. Institutions, Arrangements and Preferences for Inflation Stability: Evidence and Lessons from a Panel Data Analysis. Journal of Macroeconomics 30, 282–307.

Levieuge, G. and Y. Lucotte, 2014. A Simple Empirical Measure of Central Banks' Conservatism. Southern Economic Journal, 81, 409-434.

Peek, J., Rosengren E., Tootell, G. 1999. "Using bank supervisory data to improve macroeconomic forecasts", New England Economic Review, Federal Reserve Bank of Boston, issue Sep, 21-32.

Roger, S., 2010. Inflation Targeting turns 20. International Monetary Fund, Finance and Development 47, 46-49.

Roodman, D., 2009. A Note on the Theme of Too Many Instruments. Oxford Bulletin of Economics and Statistics 71, 135–158.

Ueda, K. and F. Valencia, 2014. Central bank independence and macro-prudential regulation. Economics Letters, 125, 327-330.

Windmeijer, F., 2005. A Finite Sample Correction for the Variance of Linear Efficient Two-Step GMM Estimators. Journal of Econometrics 126, 25–51.

Table 1. Bank Supervision function and Central Bank Conservatism

VARIABLES	(1) All^{a,1}	(2) All^{a,2}	(3) Floating^{a,1}	(4) Floating^{a,2}	(5) All^{b,1}	(6) All^{b,2}	(7) Floating^{b,1}	(8) Floating^{b,2}	(9) All^{b,1}	(10) All^{b,2}	(11) Floating^{b,1}	(12) Floating^{b,2}
Lag of Conservatism	-0.0711	-0.150	0.0338	-0.205	-	-	-	-	-	-	-	-
	(0.0971)	(0.131)	(0.111)	(0.215)	-	-	-	-	-	-	-	-
Separation	0.119**	0.480**	0.0414	0.599*	0.016*	-.022	.021**	.017	-1.743*	-1.212*	-1.725**	-1.550*
	(0.0600)	(0.238)	(0.0866)	(0.317)	(0.007)	(.023)	(.008)	(.042)	(.809)	(.662)	(.731)	(.716)
CBI	-0.193	0.0112	-0.127	-0.525**	0.173	.231	.156***	.230**	-7.331**	-3.991**	.469	-4.816**
	(0.265)	(0.590)	(0.271)	(0.216)	(0.056)	(.074)	(.044)	(.078)	(2.760)	(1.687)	(3.742)	(1.844)
GDP Growth	-0.00383	-0.0221	-0.00367	-0.0428	0.005	.003	.009	.007	-.275	-.091	-.439	-.010
	(0.0256)	(0.0298)	(0.0161)	(0.0507)	(0.003)	(.002)	(.006)	(.004)	(.212)	(.051)	(.290)	(.038)
IT	0.174**	0.305*	0.0257	0.410**	0.040**	.036**	.059***	.058**	-5.275***	-.635	-6.704***	-.549
	(0.0779)	(0.156)	(0.0766)	(0.176)	(0.014)	(.014)	(.017)	(.021)	(1.515)	(.381)	(1.875)	(.926)
Trade Openness	0.00119	0.00128	-0.000148	-0.000361	-0.0002	-.0002	.001*	.0006*	.060***	-.007*	.019	-.009***
	(0.00208)	(0.00208)	(0.00194)	(0.00164)	(0.004)	(.0004)	(.0003)	(.0003)	(.014)	(.004)	(.013)	(.002)
KAOPEN		-0.0711		0.184*		.040*		.040		.005		-.211
		(0.118)		(0.0998)		(0.020)		(.025)		(.209)		(.247)
Developed dummy	0.0322	0.222	-0.0304	-0.227	-	-	-	-	-	-	-	-
	(0.135)	(0.306)	(0.129)	(0.154)	-	-	-	-	-	-	-	-
Government Spending	-0.0164	-0.0161	0.00246	-0.0127	-0.009**	-.012*	-.014**	-.020*	-1.064***	.115	-1.422***	.021
	(0.0115)	(0.0118)	(0.0108)	(0.0159)	(.004)	(.005)	(0.004)	(.009)	(.156)	(.102)	(.298)	(.087)
Domestic Credit		0.000563		0.000623		-.001**		-.0005		.0132		.012
		(0.00139)		(0.000888)		(.0003)		(.001)		(.008)		(.011)
DomesticCredit*Separation		-0.00132		-0.00151		.001**		.0005		-.014*		-.0102
		(0.00127)		(0.00103)		(.0004)		(.0009)		(.008)		(-.010)
IT*Separation		-0.346		-0.438**		-.033		-.039		1.770**		2.268***
		(0.234)		(0.212)		(.024)		(.031)		(.751)		(.697)
Constant	0.738**	0.880*	0.927***	0.969***	0.898***	.972***	0.918***	1.017***	19.210***	4.192*	28.721***	5.770***
	(0.296)	(0.499)	(0.239)	(0.284)	(0.040)	(.063)	(.067)	(.046)	(2.424)	(2.181)	(5.133)	(1.223)
Observations	385	378	264	257	420	420	281	281	420	420	281	281
AR(1)	0.072	0.143	0.137	0.135	-	-	-	-	-	-	-	-
AR(2)	0.335	0.539	0.971	0.668	-	-	-	-	-	-	-	-
Hansen Test	0.753	0.339	0.138	0.493	-	-	-	-	-	-	-	-
No of Instruments	22	25	22	25	-	-	-	-	-	-	-	-
No of Countries	35	35	24	24	35	35	24	24	35	35	24	24

Notes: [a] refers to GMM estimation, while [b] refers to fixed-effects. 1 and 2 stands for the parsimonious and the extended version of equation (2), respectively. For GMM, robust standard errors with finite-sample correction for the two-step covariance matrix as developed by Windmeijer (2005) are reported in parenthesis. We collapse our instruments as suggested by Roodman (2009) to reduce moment conditions. For fixed-effects, Driscoll-Kraay standard errors are reported in parenthesis. *** , ** , * shows statistical significance for 1%, 5% and 10%, respectively.